

4.0 Environmental Consequences and Mitigation

4.1 Introduction

This chapter presents the anticipated environmental impacts for the Preferred Alternative, the Westerly Bypass Only Alternative, compared to the No Build Alternative. All impacts are based upon a typical roadway section of 12 meters (40 feet), within a 61 meter (200 foot) right-of-way. The final design of the Preferred Alternative will avoid and minimize impacts to resources, where possible.

4.2 Transportation Environment

This section describes the future transportation environment in the Study Area for the No Build and Westerly Bypass Only Alternatives. Measures of effectiveness (MOEs) were evaluated to determine the relative transportation benefits of each alternative. The MOEs include: traffic volumes; vehicle delay and level of service (LOS); vehicle-miles traveled/vehicle-hours traveled; crash reduction, and benefit/cost ratios.

Changes in traffic volumes on certain Study Area roads are a direct indicator of the effectiveness of an alternative. The impacts on LOS and vehicle delay are determined largely by the changes in traffic volumes and the capacities of the affected roadways and intersections. Changes in the number of vehicle-miles and vehicle-hours traveled are determined by travel route and by the distances or time saved (or not saved) by motorists diverting to the Westerly Bypass Only Alternative. Estimates of crash reductions are based on changes in traffic volumes and differences in roadway characteristics.

4.2.1 Traffic Volumes

Daily Traffic Volumes in the Study Area

Over the 25 year period from the base year, 2000, to the design year, 2025, traffic volumes on the Study Area roads are forecasted to grow between 50 percent and 95 percent. Table 4-1, page 4-2 summarizes the resultant Average Daily Traffic volumes on the major roads in the Study Area. By comparing the future year 2025 No-Build traffic volumes to the year 2000 existing traffic volumes, and then to the future year 2025 traffic volumes with the Westerly Bypass Only Alternative, notable changes are evident.

For example, traffic volumes on Routes 4/115/202, west of Exit 11, would increase by 9,010 vehicles per day (vpd) (64 percent) over existing conditions under the No-Build Alternative. With the Westerly Bypass Only Alternative, 2025 traffic on this segment of Routes 4/115/202 will increase even further, by 8,070 vpd (35 percent) over the No Build Alternative, as a result of traffic diverting from Gray Village to the bypass via Routes 4/115/202 between Exit 11 and the bypass. At a location west of the bypass, however, traffic volumes on Route 4/115/202 would be the same for both the No-Build and the Westerly Bypass Only Alternatives.

The bypass itself is forecasted to carry 16,390 vpd in the year 2025. Much of this traffic will be diverted trips traveling between the Maine Turnpike Exit 11 and Route 26 north of

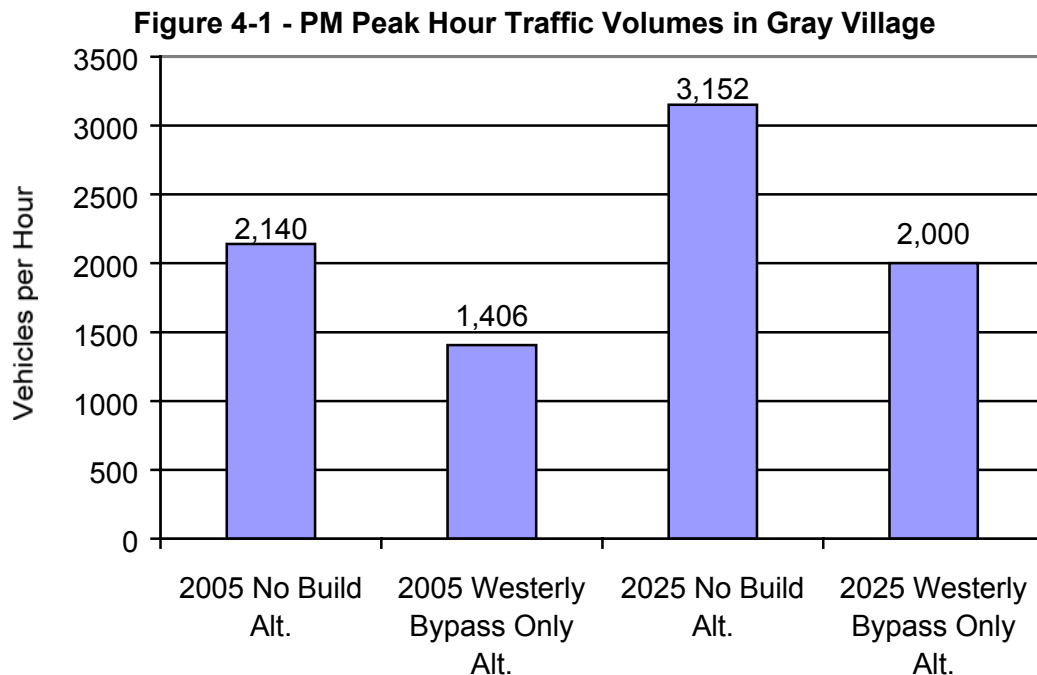
Gray Village. Other trips diverted to the bypass will consist of trips traveling between Routes 4/115/202 west of Gray Village and Route 26 north of Gray Village. The net effect of both these diversions is to reduce travel through Gray Village, and on Route 26 north of Gray Village by 16,390 vpd, a 55 percent reduction in Route 26 traffic as compared to the future year No-Build Alternative. With the Westerly Bypass Only Alternative, future year 2025 traffic volumes on Route 26 north of Gray Village will actually be 26 percent (4,730 vpd) less than existing, year 2000 traffic volumes.

Table 4-1
Average Daily Traffic: Existing, Future No-Build Alternative, & Future Westerly Bypass Only Alternative

Road	Year 2000 Average Daily Traffic (Vehicles per day)	Year 2025, No Build Alt. Average Daily Traffic (Vehicles per day)	Year 2025, Westerly Bypass Only Alternative Average Daily Traffic (Vehicles per day)
Routes 4/115/202, west of Exit 11	14,130	23,140	31,210
Routes 4/115/202, west of Proposed Bypass	14,130	23,140	23,140
Maine Turnpike Exit 11	15,050	29,350	29,350
Routes 26/100, south of Gray Village	12,370	18,650	18,650
Route 115, east of Gray Village	6,050	9,780	9,780
Brown Street, east of Gray Village	2,980	4,470	4,470
Routes 4/100/202, north of Gray Village	13,600	21,600	21,600
Route 26, north of Gray Village	17,850	29,510	13,120
Proposed Bypass	N/A	N/A	16,390

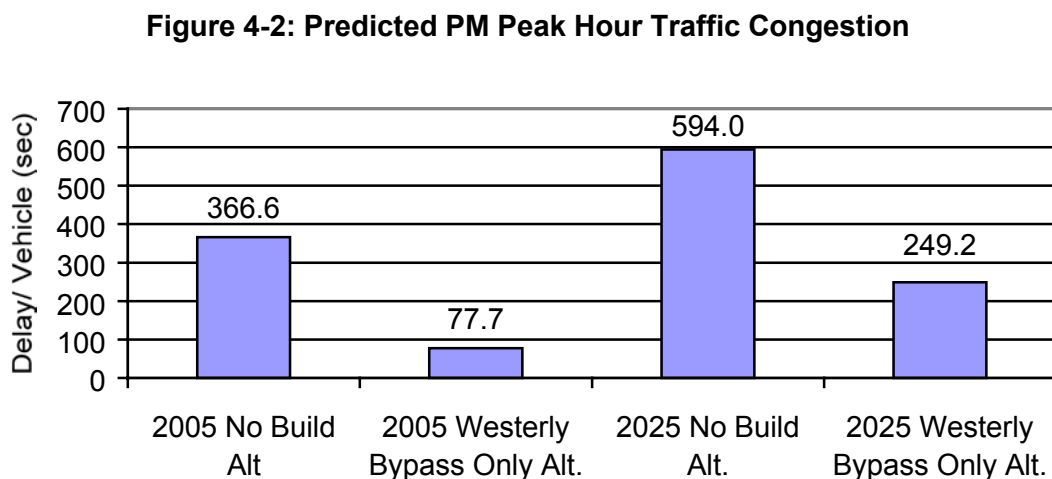
Peak Hour Traffic Volumes in Gray Village

Figure 4-1, page 4-3 identifies the 2005 and 2025 PM peak hour traffic volumes in Gray Village for the No-Build and Westerly Bypass Only Alternatives. Diversion of traffic from Gray Village is a primary goal and is a key indicator of the effectiveness of the Westerly Bypass Only Alternative. The peak hour volume diverted from Gray Village by the Westerly Bypass Only Alternative ranges from 734 vehicles (in 2005) to 1,152 vehicles (in 2025). These diversions represent 34 percent and 36 percent reductions in traffic volume through Gray Village in the respective years 2005 and 2025.



4.2.2 Travel Delay and Level of Service

Figure 4-2 shows the aggregate peak hour delay for all roads and intersections in the Study Area. For purposes of comparison, delay is defined as the excess time experienced by vehicles slowed or stopped in traffic. The aggregate delay for the Westerly Bypass Only Alternative would be approximately 40 percent of the delay experienced under the No Build Alternative in the year 2025.



Levels of service (LOS) will also improve with the Westerly Bypass Only Alternative (See Table 4-2 below). Both Gray Village intersections will operate at LOS D in year 2025 under the Westerly Bypass Only Alternative, as compared to LOS F, under the No-Build Alternative. Average vehicle stopped delays will also improve measurably with reductions in delay of 53 percent (58 sec.) and 72 percent (147 sec.) respectively, at the southerly and northerly Gray Village intersections. The Maine Turnpike Exit 11 intersection with Routes 4/115/202 also would improve from LOS F (416 seconds of delay) under the No Build Alternative to LOS E (41 seconds of delay) under the Westerly Bypass Only Alternative. Additional intersection approach lanes will be needed on some approaches of these intersections, however, these needs will not be as extensive as those required under the Upgrade Alternative.

The intersection of Route 26 and Libby Hill Road will not experience changes in traffic volume as a result of the Westerly Bypass Only Alternative. At this location, LOS will remain at LOS F. Traffic signal warrants will be met by the year 2025, indicating the need for traffic signals irrespective of whether a bypass is built.

Changes in LOS are noteworthy at two road segments within the Study Area. Most notable is the improvement on Route 26 north of Gray Village. LOS will improve from LOS F (No Build) to LOS E (Westerly Bypass Only). The seemingly minor improvement in LOS is due to the physical characteristics of Route 26, which tend to limit the achievable LOS, irrespective of the volume of traffic on the road. A better indicator of the level of improvement in congestion and traffic flow is the volume-to-capacity (v/c) ratios, which will be substantially reduced from a value greater than 1.0 (No Build) to 0.37 (Westerly Bypass Only). Routes 4/115/202 between the Turnpike Exit 11 and the bypass will experience increased traffic volumes and therefore higher v/c ratios and poorer LOS. Measures to improve this segment could include widening Routes 4/115/202 by one lane in each direction, rather than by one lane in the eastbound direction only.

Table 4-2
Year 2025 PM Peak Hour Levels of Service

Location	No-Build Alternative	Westerly Bypass Only Alternative
Routes 26/100 @ Route 4/115/202. (Southerly Gray Village Intersection)	LOS F (202 sec. delay)	LOS D (55 sec. delay)
Routes 4/100/202 @ Rte. 26/Brown Street (Northerly Gray Village Intersection)	LOS F (108 sec. Delay)	LOS D (50 sec. delay)
Maine Turnpike Exit 11 @ Rte. 4/115/202	LOS F (416 sec. delay)	LOS D (41 sec. delay)
Bypass @ Rte. 4/115/202	N/A	LOS C (25 sec. delay)
Bypass @ Rte. 26	N/A	LOS C (34 sec. delay)
Route 26 @ Libby Hill Road	LOS F (140 sec. delay)	LOS F (140 sec. delay)
Route 26 north of Gray Village	LOS F v/c > 1.00	LOS E v/c = 0.37
Routes 4/115/202 west of Exit 11	LOS E v/c = 0.83	LOS F v/c > 1.00

4.2.3 Vehicle-Miles/Vehicle-Hours Traveled

The Westerly Bypass Only Alternative will have an impact on travel patterns in the Study Area. For some trips, it will offer a route that is shorter in both time and distance when compared to travel via existing routes under the No Build Alternative. For other trips, the Westerly Bypass Only Alternative will offer a route that is shorter in time, but longer in distance. For the remaining trips, the existing route may remain the most attractive. Under the Westerly Bypass Only Alternative, the combination of effects on route choices will result in a net reduction in Vehicle-Hours Traveled (VHT) but a net increase in Vehicle-Miles Traveled (VMT) for the Study Area.

Table 4-3 below shows the VMT and VHT values for the No-Build and the Westerly Bypass Only Alternatives over a 12-hour period.

Table 4-3
2005 and 2025 12-Hour Vehicle-Miles Traveled (VMT) and
Vehicle-Hours Traveled (VHT)

Alternative	2005 VMT	2005 VHT	2025 VMT	2025 VHT
No-Build	36,663	2,913	38,142	7,732
Westerly Bypass Only	39,504	1,937	50,239	5,585

VMT – vehicle miles traveled

VHT – vehicle hours traveled

4.2.4 Crash Reductions

Three high crash location (HCL) intersections (nodes) and two HCL roadway segments (link) currently exist within the Study Area. Two of these HCLs are within Gray Village, and one is Route 26, north of Gray Village.

Reductions in the number of crashes can be expected in part by reducing vehicle-miles traveled (VMT), but primarily by diverting traffic from locations with a high incidence of crashes (village streets with numerous curb cuts) to locations with an anticipated low incidence of crashes (highways with controlled or limited access). With the No Build Alternative, VMT would increase over existing conditions as a result of the forecasted growth in traffic volume. This is anticipated to result in increased frequency and number of accidents at all HCL locations, particularly in and adjacent to Gray Village. With the Westerly Bypass Only Alternative, VMT will be higher than the No Build Alternative, but traffic diversions to the proposed bypass will offset the negative effect of higher VMT because the diverted traffic will be using a controlled access road (the bypass) with superior design features and minimal curb cuts and intersections.

Improvements to three of the five High Crash Locations in the Study Area are anticipated with the Westerly Bypass Only Alternative. These improvements are anticipated at both Gray Village intersections and on Route 26 north of Gray Village. Improvement at the fourth and fifth HCLs in the Study Area (Exit 11 @ Routes 4/115/202; and, Routes 4/115/202 between Exit 11 and McConkey Road) is not expected because traffic volumes are not reduced.

4.2.5 Benefit/Cost Analysis

The benefit/cost analysis is a means of quantifying the monetary value of the transportation benefits of alternative actions, compared to the costs of the alternative actions. The analysis yields a ratio known as the benefit/cost ratio (B/C ratio). A B/C ratio greater than or equal to one (1.0 or greater) indicates that the value of the transportation benefits accrued with an alternative exceed the costs of that alternative, and therefore suggests that the alternative is an economically feasible investment when considering transportation costs and benefits. Conversely, a B/C ratio that is less than one (0.99 or less) indicates that the transportation benefits accrued by the alternative do not exceed the costs, and therefore suggests that the alternative would not be an economically feasible investment when considering transportation costs and benefits. The estimated B/C ratio for the Westerly Bypass Only Alternative is 1.57 in 2005 and 4.51 in 2025, indicating this alternative will be an economically feasible investment when considering transportation costs and benefits. It is important to note that B/C ratios are only one factor to be considered in the MDOT's balanced decision-making process.

4.3 Physical and Biological Environment

4.3.1 Soils and Geology

No Build Alternative

Under the No Build Alternative, there would be no impact to soils or geology within the Study Area.

Westerly Bypass Only Alternative

The Westerly Bypass Only Alternative will have no substantial impact to soils and geology in comparison to the No Build Alternative. Soil types will dictate design considerations for this alternative such as potential frost heaving due to low permeable soils along this alternative. The coarser-textured soils within the northern portion of this alternative are associated with a sand and gravel aquifer and are more permeable. Stormwater design features will be incorporated to minimize impacts to the aquifer within this area. The kettle-hole bog will not be impacted by this alternative.

4.3.2 Water Resources

Groundwater

No Build Alternative

Impacts to groundwater resources under the No Build Alternative stem from the possibility of infiltration of deicing chemicals or petroleum products from roads within the Study Area. However, protection of the Gray Water District water supply wells is of paramount importance and measures to prevent contamination are consistently applied. The No Build Alternative would not alter the existing potential for contamination by vehicles traveling on Route 26, except that traffic growth on Route 26 would increase this potential over existing conditions.

Westerly Bypass Only Alternative

The primary impact the Westerly Bypass Only Alternative may have on groundwater resources would be in relation to the Gray Water District water supply wells. This may include loss of recharge area and potential impacts to water quality from deicing chemicals and petroleum spills. However, this Alternative will divert traffic away from the section of Route 26 that passes close to the wells, thus providing some mitigation of the existing condition.

The preliminary design proposes a roadway with a typical width of 12 meters (40 feet) and approximately 1,829 meters (6,000 feet) long, which will result in approximately 2.2 hectares (5.5 acres) of new impervious area. Approximately 1.1 hectares (2.7 acres) or 914 meters (3,000 linear feet) of the proposed roadway, from Route 26 south, will be located within the Town of Gray Wellhead Protection District 1 (WH1) and the Aquifer Overlay Zone. The Town of Gray zoning requires that measures must be taken to minimize impacts to groundwater recharge and stormwater runoff (Town of Gray 1994, Sections 402.23 F1-6). Avoidance and minimization of potential impacts will occur during the final design phase.

Potential impacts to groundwater quality from the Westerly Bypass Only Alternative may include impacts from roadway de-icing and from potential spills or releases from vehicles during both construction activities and following completion of the new roadway. The Gray Zoning Ordinance states that prohibited activities with the Aquifer Overlay Zone (AOZ) and the Wellhead Protection District 1 (WH1) include “no application of de-icing chemicals, except sand with a salt content of no more than ten (10) percent” (Town of Gray 1994, Sections 402.23 D4 and 402.25 F4). Roadway de-icing activities will have to follow these regulations.

Impacts to water quality may also result from roadway runoff containing petroleum-related constituents from vehicles operating on the new roadway or from direct spills from vehicle accidents. Runoff from the new roadway may recharge directly to the sand and gravel aquifer recharging the Gray Water District water supply wells. Roadway runoff could be directed to the south to reduce the potential for groundwater contamination. Proper emergency response measures will need to be in-place to reduce or eliminate potential impacts from spills related to vehicle accidents especially spills associated with tanker trucks carrying fuels or other chemicals.

Surface Waters**No Build Alternative**

The No Build Alternative would not have any impact to surface waters within the Study Area.

Westerly Bypass Only Alternative

The Westerly Bypass Only Alternative will have limited impacts to surface waters. There will be no portion of the proposed roadway that would be located within 150 meters (500 feet) of a DEP classified stream. Construction impacts to surface waters will be minimized by reducing and eliminating potential runoff through the use of MDOT Best Management Practices for Soil Erosion and Sediment Control (MDOT, 2000).

4.3.3 Vegetation

No Build Alternative

The No Build Alternative would not impact vegetative communities.

Westerly Bypass Only Alternative

The Westerly Bypass Only Alternative will affect a combination of forest and cropland. The Preferred Alternative has been designed to minimize impacts to the cornfield and existing woodlot. From Routes 4/115/202 heading north, the bypass will bisect a small woodland and cross an emergent wetland (Section 4.3.6, page 4-9) prior to crossing the eastern edge of a cornfield. At the northern end of the bypass, the road will bisect another small woodlot at the intersection with Route 26. The major vegetative community types identified within the Study Area, white pine-mixed hardwood forest and cropland, are not unusual or exemplary. Previous disturbance in the Study Area has left residual forest stands as small fragments of a much larger forested tract to the west. The upland forest fragment in particular lacks the dense canopy and extensive size range of well-developed examples of this forest type. Vegetation anticipated to be impacted includes eastern hemlock (*Tsuga canadensis*), red oak (*Quercus rubra*), white pine (*Pinus strobus*), red maple (*Acer rubrum*), witch hazel (*Hamamelis virginiana*), cattail (*Typha latifolia*), blue-joint grass (*Calamagrostis canadensis*), and speckled alder (*Alnus incana*).

4.3.4 Wildlife

No Build Alternative

The No Build Alternative would have no direct impacts on wildlife.

Westerly Bypass Only Alternative

Currently, east-west movement of wildlife is compromised by the presence of the Maine Turnpike, and it will be further reduced by the Westerly Bypass Only Alternative. In addition, loss of farmland will reduce foraging habitat, but it is not expected to have an effect on breeding. There are no State mapped vernal pools within the bypass corridor.

4.3.5 Aquatic Habitats

No Build Alternative

The No Build Alternative would not have any impact on aquatic habitats.

Westerly Bypass Only Alternative

The headwaters of an unnamed tributary to Thayer Brook will be crossed at the southern end of the Preferred Alternative. The unnamed tributary at the proposed road crossing does not meet the criteria of a DEP stream. Neither this tributary nor Thayer Brook were identified as potential fisheries habitat. There will be no direct impact to Libby Brook or its tributaries. MDOT Best Management Practices for Erosion and Sediment Control

(MDOT, 2000) will be implemented where appropriate, to minimize construction impacts.

4.3.6 Wetlands

No Build Alternative

The No Build Alternative would not impact any wetland resources.

Westerly Bypass Only Alternative

The Westerly Bypass Only Alternative will impact approximately 0.4 hectares (1 acre) encompassing two wetlands (Wetlands W1 and W2) within the Thayer Brook watershed. A summary of functions and values of these wetlands is provided in Table 4-4.

Table 4-4
Principal Valuable Wetland Functions

Function/Value	Wetland^{2,3}	
	W1	W2
Groundwater Recharge/Discharge ¹	D	D
Floodflow Alteration		X
Fish & Shellfish Habitat		
Sediment/Toxicant Retention	X	X
Nutrient Removal		X
Production Export		X
Sediment/Shoreline Stabilization		
Wildlife Habitat		X
Recreation		
Educational Scientific Value		
Uniqueness/Heritage		
Visual Quality/Aesthetics		
Endangered Species Habitat		
Total Wetland Functions	2	6
Total Wetland Size: Hectares (Acres)²	0.1 (0.3)	>4 (>10)
Dominant Wetland Cover Type ²	PEM	PEM/PFO
Preliminary Impact in Hectares (Acres)	0.1 (0.3)	0.3 (0.7)
Cover Type Impact ³	PEM	PEM/PFO

¹ R=Recharge D=Discharge X= Principle Valuable Wetland Function

² Wetland size and impact areas are estimates.

³ PEM=Palustrine Emergent Wetland, PFO=Palustrine Forested Wetland

Wetland W1 is a small isolated wetland, which has been fragmented by an access road and disturbed by ditching along Routes 4/115/202. Wetland W1 is classified as a Palustrine Emergent Marsh (PEM) (Figure 3-3, page 3-9). Proposed impacts are estimated to be 0.1 hectares (0.3 acres) of PEM resulting in a loss of sediment/toxicant retention and groundwater discharge. Wetland W2 would sustain approximately 0.3 hectares (0.7 acres) of impact at two locations, a crossing of a Palustrine Emergent Marsh, and a Palustrine Forested Wetland (PFO) (Figure 3-3, page 3-9). The PEM

crossing would be minimized by routing the road across a constriction in the wetland parallel to a private crossing of a commercial development. The wetland will continue to function in water quality improvement, production export and floodflow alteration. Wildlife habitat will be impacted due to the fragmentation of the wetland and associated upland. Avoidance and minimization efforts will be continued during final design, and unavoidable impacts to wetlands will be compensated, consistent with ACOE and MDEP regulations.

Construction impacts to wetlands will be minimized through the use of MDOT Best Management Practices for Erosion and Sediment Control (MDOT, 2000).

4.3.7 Floodplains

There are no floodplains within the Study Area.

4.3.8 Threatened and Endangered Species

No Build Alternative

Under the No Build Alternative, there would be no impacts to threatened and endangered species.

Westerly Bypass Only Alternative

No threatened or endangered plant species have been documented within the bypass corridor based on a review of the Maine Natural Areas Program Biological and Conservation Data System (Pinkham, 2001). With the exception of transient bald eagles (*Haliaeetus leucocephalus*), there are no federal or state rare, threatened or endangered species within the Study Area.

4.4 Atmospheric Environment

An evaluation of the atmospheric environment for the Study Area was performed based on the U.S. Environmental Protection Agency's (EPA) and Federal Highway Administration (FHWA) procedures, with guidance from Maine Department of Environmental Protection (MDEP) and Maine Department of Transportation (MDOT).

4.4.1 Air Quality

No Build Alternative

Under the No Build Alternative, growth in traffic due to normal population growth will tend to result in increased vehicle emissions (see Section 4.2.1, page 4-1). The growth in traffic will be offset somewhat by a decrease in motor vehicle emission factors, as older and more polluting vehicles in the nation's fleet are replaced by new vehicles which have lower emission rates, as prescribed in the "Federal Motor Vehicles Emission Control Program" (FMVECP) mandated in the Clean Air Act (1970). These offsetting factors would likely result in small increases in CO emissions and local concentrations.

Westerly Bypass Only Alternative

The Westerly Bypass Only Alternative has been determined to conform to the Maine State Implementation Plan (SIP) in accordance with the requirements of the CAAA. The Preferred Alternative is not anticipated to create or contribute to a new violation of the NAAQS, nor worsen any existing violation of the NAAQS. Therefore, no long-term air quality mitigation measures are required for this project.

4.4.2 Noise

No Build Alternative

Under the No Build Alternative, the noise levels in the Study Area are expected to increase due to the projected increase in traffic volumes on all roadways. Noise levels along Routes 4/115/202 (Receptor R1) (See Figure 3-5, page 3-18) for receptor locations) are expected to increase by approximately 3 dBA, while noise levels along Route 26 are expected to increase by approximately 5 dBA at Receptor R4. Noise levels at Receptor R3 along Route 26 are expected to increase by approximately 3.5 dBA. Noise levels in Gray Village (Receptor R2) are expected to increase by 5.4 dBA.

As a result of the increase in traffic volumes for the future year 2025 No Build Alternative, the noise levels in Gray Village (Receptor R2) and Route 26 (Receptor R4) are expected to exceed the FHWA Noise Abatement Criteria (NAC).

Table 4-5, compares the existing and future No Build and Westerly Bypass Only Alternative Leq noise levels.

Table 4-5

Comparison of Existing and Future (2025) No Build, and Westerly Bypass Only Alternative Leq Noise Levels

Receptor #	Site Location	Existing Baseline Leq (dBA)	Future No-Build Leq (dBA)	Future Westerly Bypass Only Alt. Leq (dBA)	FHWA Noise Abatement Criteria (dBA)
R1	Routes 4/115/202	57.0	60.1	63.1	72
R2	Gray Village	67.5	72.9	69.4	72
R3	Route 26	60.0	63.5	60.4	67
R4	Route 26	62.0	67.1	64.0	67

Westerly Bypass Only Alternative

The predicted traffic noise levels for the Westerly Bypass Only Alternative, when compared to the future No Build Alternative, are expected to decrease because of the reduced traffic volumes on Route 26 in Gray Village. The noise levels are expected to decrease by 3.5 dBA in Gray Village (Receptor R2), and by 3.1 dBA along Route 26 (Receptors R3 and R4). However, along Route 4/115/202 (Receptor R1), the noise levels are expected to increase by 3 dBA due to the increase in traffic volume along this section of road, but these levels will not exceed the FHWA NAC.

When compared to the existing baseline noise levels, the Westerly Bypass Only Alternative will result in an increase in noise levels along all roads due to the increase in traffic volumes in the future year 2025. The noise levels are expected to increase by 1.0 dBA in Gray Village (Receptor R2), and to increase along Route 26 by 0.4 dBA at Receptor R3 and by 2.0 dBA at Receptor R4. Noise levels along Routes 4/115/202 (Receptor R1) are expected to increase by 6.1 dBA.

The results of the noise assessment indicate that no residential or commercial receptors in the vicinity of the Westerly Bypass Only Alternative exceed the FHWA or MDOT noise impact criteria. MDOT's Highway Traffic Noise Policy states that a noise impact will occur if the difference between the existing Leq noise level and the predicted noise level for the Build Alternatives is 15 dBA or greater. As a result, noise mitigation measures are not required for this alternative.

4.5 Land Use, Historic, and Socioeconomic Environment

4.5.1 Land Use and Right-of-Way

No Build Alternative

The No Build Alternative would not necessarily affect land use and zoning within the Town of Gray, however, with the future expansion of the industrial area west of Exit 11, the construction of a bypass would become increasingly difficult. This area is zoned Business Development (BD) which allows the expansion of business parks, manufacturing and warehouse uses.

The No Build Alternative would not improve traffic deficiencies in Gray Village, while the number of trips would continue to increase, due to forecasted growth (see Section 4.2, page 4-1). Future development within the area west of Exit 11 would be affected by increasing traffic volumes and deteriorating LOS in Gray Village and the Study Area. Traffic congestion would impact future development projects by increasing travel time of employees and customers that access those land uses. In addition, future development projects may have difficulty satisfying the traffic standards of state and local permits/approvals.

Under the No Build Alternative, no right-of-way would be required and no properties would be impacted.

Westerly Bypass Only Alternative

The Westerly Bypass Only Alternative will directly impact land uses through the acquisition of new right-of-way and conversion of a variety of land uses to transportation use. The Westerly Bypass Only Alternative will be a limited access facility. Future development plans within the Town of Gray are projected to occur on the west side of the community between the Maine Turnpike and areas north of the Study Area, which is currently zoned as Business Development District (BD). In addition, approximately 14.5 hectares (36 acres) will be considered as a non-developable buffer between the bypass and the Maine Turnpike to protect the aquifer resources. Gray's Comprehensive Plan (1991) states that it is anticipated that a bypass will be created as part of the Town's long term transportation project goals. The impact of the Westerly Bypass Only Alternative on local development will be to support planned expansion of residential development in current residential areas, and to support planned industrial development on the western side of Town, specifically, the Northbrook Business Park. (See Figure 3-6, page 3-19).

The Westerly Bypass Only Alternative will require the acquisition of approximately 12.1 hectares (30 acres) of land from approximately 14 property owners. There will be one residential relocation, but no commercial relocations are expected with the Westerly Bypass Only Alternative. This residential property was assessed at \$118,100 (2001\$). The amount of buildable land for sale and the available inventory of homes within the Town of Gray during the spring of 2001 was limited, with approximately 10 homes on the market, according to area realtors.

The Uniform Relocation Assistance and Real Property Acquisition Policies Act states that no person shall be displaced by federal or federally-assisted construction projects unless adequate replacement housing has been provided for, open to all persons regardless of race, color, religion, sex, national origin or handicap. Residential occupants are entitled to relocation housing payments to assist them in purchasing or renting comparable decent, safe and sanitary replacement housing.

4.5.2 Prime and Unique Farmland**No Build Alternative**

The No-Build Alternative would not have any impacts on Prime Farmland and Additional Farmland of Statewide Significance.

Westerly Bypass Only Alternative

The Westerly Bypass Only Alternative will impact farmland of statewide importance. The Farmland Conversion Rating Form (Form AD 1006) was submitted to determine if any additional impacts to Prime, Unique or of Statewide Importance farmland are proposed. In addition, the eastern edge of a field, not currently used for silage corn, will be impacted.

4.5.3 Community Facilities and Services

No Build Alternative

Under the No Build Alternative, existing impacts to community facilities or services related to access and congestion would be exacerbated due to the forecasted growth in traffic (see Section 4.2.1, page 4-1).

Westerly Bypass Only Alternative

No community facilities or services will be directly impacted by the Westerly Bypass Only Alternative. The northerly terminus of the Westerly Bypass Only Alternative will be located near the Town's main Fire and Rescue Station, and the Town's Middle and High Schools, which contain numerous recreation facilities for Town residents. The reduction in congestion within Gray Village will improve travel times to these community facilities, and to other community facilities located in and around Gray Village.

The Westerly Bypass Only Alternative will benefit school bus and emergency vehicle services through reduced traffic travel times through Gray Village and by provision of the new bypass road to access the southwestern portions of the Town of Gray.

4.5.4 Neighborhood and Community Cohesion

No Build Alternative

The No Build Alternative would continue to have a negative effect on neighborhood and community cohesion within Gray Village, as future traffic conditions are projected to steadily increase. High traffic volumes negatively impact pedestrian traffic, making road crossing unsafe for pedestrians, especially children and the elderly. Access to community facilities is also negatively impacted by the No Build Alternative, due to the difficulty in entering and exiting properties within Gray Village as a result from long traffic queues, resulting in 3-5 minute delays through Gray Village. Increasing traffic volumes along Route 26, north of Gray Village, would also negatively impact those residents living near and on Route 26, by extending travel time along this road and by hindering movements into and out of properties.

Westerly Bypass Only Alternative

The Westerly Bypass Only Alternative bisects mainly undeveloped land between Route 4/115/202 (to the south) and Route 26 (to the north). There are no neighborhoods located near the Preferred Alternative. Therefore, impacts to neighborhood and community cohesion will be minimal.

4.5.5 Environmental Justice

There are no population segments that would have disproportionately high and adverse human health and social and economic effects, as a result of either the No Build or the Preferred Alternative.

4.5.6 Business Activity Levels

No Build Alternative

Under the No Build Alternative, existing negative impacts to Gray Village businesses would continue and worsen, as traffic volumes and congestion on Gray Village roads is projected to steadily increase (see Section 4.2.1, page 4-1). This in turn diminishes vehicular and pedestrian access to businesses and retailers located there. Potential shoppers that are travelling through Gray Village are subjected to long traffic delays (5-10 minutes) through Gray Village intersections. If allowed to continue, these conditions would ultimately drive residents and businesses away from Gray Village.

Westerly Bypass Only Alternative

The Westerly Bypass Only Alternative will have a positive impact on the local and regional economy. The proposed bypass will facilitate the safe and efficient movement of goods and people and reduce traffic congestion in Gray Village. Local businesses will benefit from improved access conditions and a more pedestrian friendly environment. Most of the local businesses are destination-oriented businesses, therefore they will not be adversely affected by the loss of pass-by traffic. The bypass will make it easier for destination businesses to prosper, by relieving traffic congestion in the center of Gray Village. Even those businesses that rely on pass-by traffic do not anticipate that a bypass will adversely affect their businesses. In addition, the bypass will reduce transportation costs for residents and businesses by decreasing travel time and improving access to Gray Village businesses by reducing traffic and long queues. The Preferred Alternative will alleviate traffic along Routes 4/100/202 and Routes 4/115/202, therefore providing greater access to businesses located there.

4.5.7 Economic Impacts

No Build Alternative

The No Build Alternative would have negative economic impacts on Gray Village businesses. As traffic levels increase over time, access to businesses in Gray Village would become increasingly difficult, deterring both impulse and destination-oriented shoppers. Traffic congestion would also deter Gray Village businesses from expanding, due to the increased difficulty in accessing these businesses during peak periods.

As an important link in the National Highway System to communities and recreation areas to the northwest, congestion in Gray Village and along Route 26 hinders accessibility between these regions, southern Maine, and the rest of the United States.

Westerly Bypass Only Alternative

The Westerly Bypass Only Alternative will have positive impacts to the local and regional economy, such as providing improvements to the local and regional road infrastructure, and facilitating the safe and efficient movement of goods and people to and through the Town of Gray, Gray Village, and communities to the northwest that are accessed via Route 26. The Westerly Bypass Only Alternative will provide an alternative route from Route 26 (north) to the proposed expansion to the industrial area located northwest of the Maine Turnpike interchange. The Westerly Bypass Only Alternative will support

planned development opportunities within the industrial park, which will help increase the town's tax base. The Gray Comprehensive Plan (1991) states that it encourages the development of an industrial park in order to diversify the Town's economic base. The long traffic queues and congestion within Gray Village deter some shoppers. The bypass will improve access and allow the Gray Village businesses to prosper.

4.5.8 Historic and Archaeology Resources

No Build Alternative

The No Build Alternative would not have any direct impact to historic or archaeological resources. However, existing traffic related impacts to Stimson Hall, such as difficult access and traffic noise, would continue and worsen as traffic volumes increase in the future.

Westerly Bypass Only Alternative

Under Section 106 of the National Historic Preservation Act (NHPA), agencies are required to minimize harm to resources eligible for the National Register of Historic Places and National Historic Landmarks (NHL). Coordination with the State Historic Preservation Office (SHPO) has been ongoing during this study. One property within the Study Area has been placed on the National Register of Historic Places. Stimson Memorial Hall, located on Route 26 at Gray Village. The Westerly Bypass Only Alternative will alleviate some of the negative traffic impacts along Route 26, therefore resulting in a positive impact to the Stimson property, by increasing its accessibility by either car or pedestrian movements.

The State Historic Preservation Officer has identified potential archaeological sites within the Route 26 corridor portion of the Study Area. The potential sites, as identified, do not include the area that the Preferred Alternative intersects with Route 26 in the northern portion of the Study Area.

4.5.9 Public Parks and Recreation Lands

There would be no impacts to Gray's public parks and recreation lands as a result of the No Build or Westerly Bypass Only Alternatives.

4.5.10 Uncontrolled Petroleums and Hazardous Wastes

No Build Alternative

The No Build Alternative would not impact any uncontrolled petroleum or hazardous waste sites within the Study Area.

Westerly Bypass Only Alternative

No known areas of soil or groundwater contamination were identified within, or in the vicinity of the Study Area. Therefore, the construction of the Westerly Bypass Only Alternative will not be impacted by any source of known contamination. To ensure that the project design does not promote migration of currently undocumented contamination,

subsurface explorations for contaminants will be conducted by the MDOT as warranted during the design phase and/or construction phase.

4.5.11 Utilities

There are no impacts to utilities anticipated under either the No Build or the Westerly Bypass Only Alternatives.

4.6 Secondary and Cumulative Impacts

Secondary impacts are defined by the Council on Environmental Quality (CEQ) in 40 CFR 1508.8 as those that are:

“caused by an action and are later in time or farther removed in distance but are still reasonably foreseeable”.

Secondary impacts are normally associated with development that may indirectly result from the construction or improvement of a facility, such as a transportation project. Secondary impacts differ from those directly associated with the construction and operation of a facility itself and are often caused by induced development. Induced development may include a variety of secondary effects such as changes in land use, water quality, economic vitality, and population density. Therefore, the potential for secondary impacts to occur is determined in part by the individual municipal planning objectives and location of the project. The Preferred Alternative, the Westerly Bypass Only Alternative is proposed to be a limited access highway. Access will be provided to two existing sites that currently have access from an existing road which will be discontinued by the bypass road. One site is the Maine Turnpike Authority (MTA) Gray Maintenance Area. The MTA currently has no plans for expanded or changed use of this site. The second site, Northbrook Business Park, is a planned business park currently developed with one building. Accessibility to the existing developments and potential future development on this site will be improved to and from the north on Route 26, by being able to bypass the Gray Village area.

The Town of Gray has requested that MDOT include the opportunity to access land located to the west of the bypass road to service planned future development. Access to this land could be accomplished by a frontage road that would be constructed in the future. During final design MDOT would establish the location at which the frontage road could safely access the bypass without affecting the efficiency of the bypass. The decision to acquire the right-of-way necessary for all or part of the frontage road would be made during the final design phase. A potential location for access would be at the intersection of the bypass with Route 26. Other locations, including access via existing roads, would be considered in the final design phase. Planning for access to this area is beneficial by allowing MDOT to maintain the through-traffic integrity of the bypass. This also will enhance the safety of the bypass. This action would be consistent with the Town of Gray's Comprehensive Plan and MDOT's Access Management policy. Any environmental impacts and necessary mitigation associated with the frontage road, or planned development would be addressed by the project proponents through their federal and state approval processes.

The Westerly Bypass Only Alternative will provide traffic relief on portions of Route 26, Route 4/115/202, and in Gray Village. Traffic reductions on these roads will potentially enhance their desirability for residential development. However, with less congestion, non-residential uses may become more desirable along the roadways leading toward the Gray Village. As stated in the Town's Comprehensive Plan, additional intensive non-residential uses are encouraged to be located away from Gray Village due to development constraints of the aquifer located in the same proximity (Figure 3-1, page 3-6). In addition, areas located close to the Gray Village are designated as medium density residential areas and residential development is encouraged. Any further future development will be contingent upon market conditions and will be regulated by zoning.

Cumulative effects are defined by the Council on Environmental Quality (CEQ) in 40 CFR 1508.7 as:

"impacts on the environment which result from the incremental impact of the action when added to other past, present and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions."

The proposed project will not result in substantial cumulative effect, in terms of intensity or context, to the social or natural features analyzed within the Study Area.

4.7 Summary of Potential Mitigation

The following measures have been identified to mitigate potential impacts of the Preferred Alternative.

4.7.1 Water Resources

Construction impacts to surface waters will be minimized through the use of MDOT Best Management Practices for Soil Erosion and Sediment Control (MDOT, 2000). The project will be constructed in accordance with the MDEP/MDOT Stormwater Memorandum of Agreement.

4.7.2 Wildlife

The Westerly Bypass Only Alternative will result in additional disruption to east-west movement of wildlife. Mitigation measures will be evaluated during the permitting and final design phase of the project, in collaboration with Federal and State Natural Resource Agencies.

4.7.3 Aquatic Habitats

The Westerly Bypass Only Alternative will not cross any streams. Libby Brook, located in the vicinity of the Study Area, originates approximately 213 to 274 meters (700 to 900 feet) west of the construction area. It will not be affected by the construction activities. MDOT Best Management Practices for Erosion and Sediment Control (MDOT, 2000) would be implemented to minimize construction impacts.

4.7.4 Wetlands

The Westerly Bypass Only Alternative will impact approximately 0.4 ha (1 ac) of wetlands. Construction impacts to wetlands will be minimized through the use of MDOT Best Management Practices for Erosion and Sediment Control (MDOT, 2000). During the permitting and design phases of project implementation, feasible avoidance and minimization measures will be evaluated to further reduce wetland impacts. For unavoidable impacts, if required, MDOT will identify a suitable wetland mitigation strategy in accordance with state and federal regulation.

4.7.5 Prime and Unique Farmland

MDOT has submitted a Farmland Conversion Rating Form (Form 1006) to the U.S. Natural Resource Conservation Service offices in Cumberland County.

4.7.6 Uncontrolled Petroleums and Hazardous Waste

During the design phase and/or construction phase, MDOT will do additional evaluations/testing, as required, to ensure that project design does not promote migration of any currently undocumented contamination. If required, potential mitigation of the project site will adhere to MDEP's stringent cleanup standards.

4.8 Irreversible and Irretrievable Commitments of Resources

While the construction and operation of a bypass road will bring benefits to the Town of Gray and surrounding region, nonrenewable resources will be consumed during the construction of the bypass. Since the reuse of these resources is not possible, they must be considered irreversibly and irretrievably committed to the development of the bypass. The finite resources that will be irretrievably committed to the implementation of the Westerly Bypass Only Alternative are the expendable materials such as gravel, asphalt, fuel and other forms of energy utilized during the construction of the road, and the supplies and energy resources necessary to maintain the road after it is constructed.

Funds committed to the design and construction of the bypass will not be available for use on other projects. The human labor expended for the construction and maintenance of the road will also be considered irrevocable.